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ABSTRACT

Results of a study that investigated the effects of instructor-pacing and self-pacing in a personalized system of instruction (PSI) course on student withdrawal rate, achievement, and attitudes are discussed in this speech. Sixty-two Arizona State University students enrolled in a political science introductory research course were randomly assigned to either a self-paced or an instructor-paced group. Results show that 10 of the 30 students (33 percent) in the instructor-paced group and 21 of the 32 students (66 percent) in the self-paced group withdrew from the course. No significant differences were found between groups in attitudes or achievements. It is therefore considered that the use of instructor-pacing in PSI courses can reduce the number of withdrawals without having adverse effects on student achievement or attitude. Other procedures that might reduce withdrawal rates in PSE courses, which are reported as higher than lecture-discussion courses, are suggested. (SPG)

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Reducing the Number of Withdrawals in Personalized System of Instruction Courses[1]

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Abstract

This study investigated the effects of self-pacing and instructor-pacing in a PSI course. Students in the course were randomly assigned to either a self-paced or an instructor-paced group. The number of students who withdrew from the course was significantly higher in the self-paced group than in the instructor-paced group. There were no significant differences between groups in attitudes or achievement. These results indicate that the use of instructor-pacing in PSI courses can reduce the number of withdrawals without having adverse effects on student achievement or attitude.

Reducing the Number of Withdrawals in Personalized System of Instruction Courses

A new system of instruction was introduced at the college level in 1963 when Fred Keller employed what has come to be known as the personalized system of instruction (PSI). Keller (1968) has described five features which he feels most clearly distinguish PSI courses from conventional lecture-type courses. He states that in a PSI course (a) instruction is presented in written form, (b) lectures and demonstrations are used for motivational purposes only, (c) student progress through the course is self-paced, (d) student mastery of the course materials is required, and (e) student-tutors are used to assist the students.

Many college courses now incorporate most, or all, of the features described by Keller (Johnson & Ruskin, 1977). Instruction in these courses usually consists of a number of small units of written material. A student may progress through the units at his or her own pace. However, a student must demonstrate mastery of the material in one unit before proceeding to the next unit. Short quizzes are used to assess student mastery of the material in each unit. Tutors correct quizzes and review quiz questions with the student. If a student's performance on a quiz indicates that he or she has not mastered the unit materials, the student must retake either the same quiz or a variation of it until he or she has demonstrated mastery. A student's final grade in the course is usually dependent on the number of units mastered, and in some cases, on performance on one or more examinations covering several units.

Many studies have been conducted to evaluate the effectiveness of PSI procedures. The results of most of these studies indicate that PSI is an effective method of instruction. Studies have shown that students taught by the PSI approach perform significantly better on examinations covering course content than students taught by the traditional lecture approach (Alba & Pennypacker, 1972; Born, Gledhill, & Davis, 1972; Cooner & Greiner, 1971; McMichael & Corey, 1969; Moore, Mahan, & Ritts, 1969; Morris & Kimbrell, 1972; Sheppard & MacDermot, 1970; Witters & Kent, 1972). Studies have also shown that student attitudes toward PSI courses are significantly more favorable than student attitudes toward lecture-type courses (McMichael & Corey, 1969; Moore et al., 1969; Morris & Kimbrell, 1972; Sheppard & MacDermot, 1970; Witters & Kent, 1972).

Although the general findings on the effectiveness of PSI are favorable, the withdrawal rate from PSI courses is often very high (Robin, 1976). This might be due to the fact that students normally are allowed to complete a PSI course at their own pace. Under this approach, students often wait many weeks before taking their first quiz. Also, many students delay doing most of the work for PSI courses until the last few weeks of the semester. The failure of many students to pace themselves effectively through a PSI course has been cited by researchers (Born & Whalen, 1973; Powers & Edward, 1974) as the primary reason for the high withdrawal rate in such courses.

In an effort to improve pacing and reduce student withdrawals, a number of instructors have instituted some type of instructor-pacing in their PSI courses (Born, et al., 1972; Malott & Svinicki, 1969; Miller, Weaver & Semb, 1974; Witters & Kent, 1972). However, there has been very little experimental research comparing the effectiveness of instructor-

pacing and self-pacing. The present study was designed, therefore, to investigate the effects of instructor-pacing and self-pacing in a PSI course on student withdrawal rate, achievement, and attitudes.

Method

Subjects

Subjects were 62 undergraduate students enrolled in a sophomore level introductory research course required of all political science majors at Arizona State University.

Procedure

Prior to the initial class session, the 62 subjects were randomly assigned to either a self-paced group or an instructor-paced group. All procedures except the pacing procedure were identical for the two groups. Students in both groups received instructional materials divided into 15 units. Ten-item quizzes were used to assess student mastery of the material in each unit. Undergraduates who had previously taken the course served as proctors, grading and reviewing the quizzes with the students. In order to receive credit for passing a quiz, a student was required to attain a quiz score of 90%. If a student scored less than 90%, the student was required, after reviewing the materials, to take other versions of the quiz until the student scored 90% or higher.

Each student's final grade for the course was determined by the total number of quizzes passed by the student and by his or her score on the final examination, with the total number of quizzes passed being the more important factor. A student had to pass at least 12 of the 15 unit quizzes to be eligible to receive a passing grade.

Students in the self-paced group were allowed to progress through the course at whatever pace they chose, the only restriction being that they had to pass a quiz for one unit before they could proceed to the next unit. For the instructor-paced group, separate schedules of dates were set which would allow the students to take at a fairly steady rate the differing number of quizzes necessary to earn a grade of A, B, C, or D. A schedule listing these target dates for each grade was given to each student in the instructor-paced group (see Figure 1). If a

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Insert Figure 1 about here

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student did not pass a quiz by the target date, the student was penalized unless he or she had passed either one quiz during the preceding week or two quizzes during the preceding two weeks. If a student was penalized three times for falling behind a pacing schedule, the student was not eligible to receive the grade assoicated with that schedule.

In both the instructor-paced and self-paced groups, students were allowed to withdraw from the course until the last week of the semester. If a student had not passed at least 12 unit quizzes by the end of the semester, the student received an F in the course.

Instructional Materials

Instruction consisted of 15 units in the textbook Political and Social Inquiry (McGaw & Watson, 1976). The textbook was developed by the instructors of the course in this study for use in courses organized on a PSI basis. Each unit contained a list of instructional objectives which described the skills students would be expected to perform after

completing the unit. Most of the skills involved identifying and defining terms and concepts associated with research procedures in political science. A number of the skills involved applying specific statistical procedures to a given set of data.

Data Sources and Criterion Measures

Data were collected and analyzed on (1) withdrawal rate, (2) student achievement as indicated by the number of unit quizzes passed and final examination scores, (3) attitudes toward the course, and (4) pacing rate. The data on withdrawal rate and pacing rate were recorded routinely as a part of the instructor's records for the course.

The achievement measures consisted of (1) the 10-item unit quizzes over each of the 15 units and (2) a comprehensive final examination. The 27-item final examination had a total value of 100 points, with each item being scored on a multiple point basis. The unit quizzes and the final examination were composed exclusively of items designed to sample student ability to perform the skills taught in the units. The final examination contained items covering each unit in the course. Students who passed less than all 15 unit quizzes were administered the final examination items up through the last unit that they had passed during the semester.

A five-choice, Likert-type attitude scale containing 12 statements about the course was also administered to the students. The attitude scale was administered to students immeditely after they completed the final examination.

Results

Withdrawal Rate

The number of students completing the course and the number withdrawing from it are listed by treatment group in Table 1. As shown

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Insert Table 1 about here

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in the table, 10 of the 30 students (33%) in the instructor-paced group and 21 of the 32 students (66%) in the self-paced group withdrew from the course. A chi-square test revealed that the withdrawal rate of the instructor-paced group was significantly lower than the rate of the self-paced group, $\chi^2 = (1)\ 5.23\ p < .05$.

Student Achievement

The student achievement measures were (1) the number of unit quizzes passed and (2) final examination scores. The number of unit quizzes passed by students who completed the course did not differ significantly between treatment groups. Seventeen of the 20 instructor-paced students (85%) who completed the course and nine of the 11 self-paced students (82%) who completed the course passed 15 unit quizzes. Table 2 lists, for each teatment group, the number of quizzes passed by students who completed the course.

Insert Table 2 about here

On the 100 point final examination, the mean scores were 81.3 for the instructor-paced group and 74.3 for the self-paced group. A t-test revealed that this difference was not statistically significant. When the scores of only those students who passed 15 unit quizzes were analyzed, the mean final examination score for the instructor-paced group was 85.7, and the mean final examination score for the self-paced group was 73.1. A comparison of these means yielded a t-ratio which was not statistically significant.

Student Attitudes

Responses to each item on the attitude survey were assigned a value from 1 (very negative) to 5 (very positive). Comparisons of the two groups' responses to each item on the attitude survey were then conducted. A comparison of the mean attitude survey scores of the two groups was also made.

Mean attitude survey scores did not differ significantly between the two treatment groups. Mean scores on the 12-item survey were 40.50 for the instructor-paced group and 39.60 for the self-paced group. These scores indicate that in both groups overall student attitude toward the course was moderately positive.

Student responses to individual items on the attitude survey also did not differ significantly between the two treatment groups. However, differences between the two groups did approach significance (at the .05 level) in the case of two items. While 79% (15 of 19) of the instructor-paced students indicated they did not have a negative attitude toward the course, only 40% (8 of 19) of the self-paced students indicated their attitude was not negative. However, 60% (11 of 19) of the self-paced students, as compared to only 21% (4 of 19) of the instructor-paced

students indicated they were less concerned about their course grade than they generally were.

Two items on the attitude survey dealt directly with the pacing procedures employed in the course. One item asked students to indicate whether they liked the pacing procedures used with their group. A second item asked students to indicate whether the pacing procedures placed too much pressure on them. Student response to these items indicated that in both groups the pacing procedures were well liked and did not place too much pressure on the students.

Pacing Rate

An examination of the average pace of the two groups indicated that instructor-paced students passed quizzes at a steadier rate than self-paced students. As Figure 2 illustrates, the instructor-paced group maintained a fairly steady pace through the course. The self-paced group progressed through the course at approximately the same pace as the instructor-paced group during the first four weeks of the semester. However, they slackened their pace considerably during the middle of the semester, and then greatly increased their pace during the last two weeks of the semester.

Insert Figure 2 about here

An analysis of the pacing rate of those students who passed at least two quizzes was also conducted. The proportion of instructor-paced students who worked through the course at a steady pace was significantly larger than the proportion of self-paced students who main-

tained a steady pace, χ^2 (1) = 9.98 $p < .01$ (Table 3). Only 5 of the 22 instructor-paced students (23%) who passed at least two quizzes went two consecutive weeks without passing a quiz, whereas 13 of the 17 self-paced students (76%) who passed at least two quizzes went two weeks without passing a quiz.

Insert Table 3 about here

Factors Affecting Withdrawals

Examination of the data revealed that three important factors were associated with student withdrawals. Students who withdrew from the course typically manifested one or more of the following behaviors: failure to take the initial quiz, failure to maintain a steady quiz-passing pace, and/or poor performance on quizzes. Thirteen of the 31 students (42%) who withdrew from the course (10 from the self-paced groups and 3 from the instructor-paced group) did not take even the initial quiz. Seven students withdrew after passing nine or more quizzes, and each of these students had gone more than two consecutive weeks on one or more occasions without passing a quiz. Students who withdrew from the course failed a significantly higher proportion of the quizzes they took than did students who completed the course, χ^2 (1) = 19.38 $p < .001$.

Insert Table 4 about here

An analysis of the withdrawal rates of those students who maintained

a steady pace and those students who did not do so was also conducted. As shown in Table 5, the withdrawal rate of students who maintained a steady pace was significantly lower than the withdrawal rate for students who did not do so, $p = .023$.

Insert Table 5 about here

Discussion

The instructor-paced procedure employed in this study resulted in a significantly lower student withdrawal rate than the self-paced procedure. The lower withdrawal rate in the instructor-paced group seemed to be attributable to the establishment of a schedule which required students to take quizzes at a relatively steady pace throughout the semester. Most of the instructor-paced students progressed through the course at a steady pace. The withdrawal rate for students who maintained a steady pace was lower than the withdrawal rate for students who did not.

Lacking an externally imposed pace, many members of the self-paced group procrastinated in their quiz-taking behavior and failed to establish the steady pace that was maintained by most students in the instructor-paced group. Previous studies have also indicated that students in instructor-paced PSI courses perform at a steadier pace than students in self-paced PSI courses (Miller et al. 1974; Robin & Graham, 1974; Benecke & Taylor, Note 1). If instructor-pacing can produce steadier quiz-taking behavior and thus, as this study indicates, reduce student with-

drawal rate, then perhaps instructor-pacing should be employed more frequently in PSI courses.

The pacing procedures employed in this study had relatively little effect on student achievement. Neither the number of unit quizzes passed nor final examination scores differed significantly between the two treatment groups.

Although mean final examination scores did not differ significantly between treatment groups, the lack of significant difference may be an artifact of the experimental procedure which permitted only students who completed the course to take the final examination. While 20 of the 30 students in the instructor-paced group completed the course and took the final examination, only 11 of 32 students in the self-paced group did so. Had all the students in both groups been required to take the final examination, it is likely that the instructor-paced students would have had a significantly higher mean final examination score than the self-paced students because so many more students in the former group completed the course and were consequently exposed to all the course content. Robin (1976) in his review of PSI studies, makes a similar point. He indicates that the similarity of performance between instructor-paced and self-paced groups in a previous study (Semb, Conyers, Spencer, & Sanchez-Sosa, 1975) may have been due to the high withdrawal rate in the self-paced group.

A claimed advantage of self-pacing is that it will be better accepted by students because they can set their own pace (Nelson & Scott, 1972). This claim is not borne out by the data from the present study. The self-paced and instructor-paced groups differed very little in their attitudes toward the course generally or toward the specific pacing

procedures used with their groups. This result is similar to previous findings (Semb et al., 1975; Benecke & Taylor, Note 1).

Although withdrawal rate was significantly lower in the instructor-pace group than in the self-paced group, both groups nevertheless had high withdrawal rates. One-third of the instructor-paced group and nearly two-thirds of the self-paced group withdrew. These rates, while much higher than the 14% average withdrawal rate reported in PSI courses, lends further support to previous findings which have indicated that PSI courses have higher withdrawal rates than lecture-discussion courses (Robin, 1976). If PSI courses are to be maximally effective, withdrawal rates must be lowered.

Several practices that are not typically employed in PSI courses appear to have potential for reducing withdrawal rates in these courses. One such practice would involve requiring either all students or students who are not performing at an acceptable pace or achievement level to meet occasionally with a member of the instructional staff for instruction and/or counseling. In most PSI courses no regular class sessions are held and students come to class only when they want to take a quiz or meet with the instructional staff. Students would not be able to ignore the course if they were required to come to class periodically to review, with the instructor or with a tutor, the course content and their progress in the course. The review sessions would also provide the instructional staff with an opportunity to work with students who were not performing well on the quizzes and/or not maintaining a regular pace.

Another procedure which might reduce withdrawal rates would be for instructors to arrange pacing schedules cooperatively with

students. There are at least two alternative procedures that could be used in order to get students involved in arranging pacing schedules. One procedure would be to have each student arrange his or her own schedule with the instructor. An alternative procedure would be to have a PSI class work as a group with their instructor in arranging one pacing schedule for the class. When the potential advantages of these two procedures are compared, it appears that the former procedure would be more effective in promoting student-instructor contact and student responsibility and involvement, whereas the latter procedure would require less work on the part of the instructional staff. The former procedure appears preferable, providing that instructional staff members are willing to devote the extra time that would be required in order to implement the procedure.

Making the first quiz in a PSI course relatively easy might also reduce the number of students who withdraw. Perhaps because of their inexperience with the PSI system, many students experience difficulty passing the quiz for the first unit. Many students in the present study withdrew after they failed at least one of the quizzes for the first unit. Had these students passed their first quiz, they might not have withdrawn. Of course, many students who pass a relatively easy first quiz may experience difficulty in later units and may subsequently withdraw from the course. Nevertheless, the possibility that success on the first quiz might prevent some students from withdrawing seems adequate justification for investigating the effect of making the first unit quiz relatively easy.

Simplifying the instructor-paced procedures employed in the present

study also could result in lower withdrawal rates. In the present study, some students withdrew because of their initial negative reaction to the instructor-paced procedures. This negative reaction might have been due to the complexity of the procedures, which involved four pacing schedules and three contingencies for imposing penalties. One way to greatly simplify the procedures would be to have just one pacing schedule for students to follow. For example, students might only be given the pacing schedule they would have to follow in order to be eligible to receive a B in the course. Students who fell behind the pacing schedule three times would be ineligible to receive a grade of A or B. If this procedure had been employed in the present study only one of the twenty instructor-paced students who completed the course would have received a lower grade.

Rewarding students for maintaining a certain pace, rather than penalizing them for failing to do so, may also help reduce withdrawal rates. In a number of studies, students have been offered bonus points for completing a unit ahead of a prespecified date. This procedure has resulted in lower withdrawal rates than those found when totally self-paced procedures are employed (Powers & Edward, 1974; Semb et al., 1975). Further study is needed to determine whether offering rewards for early completion of units is a more effective means of reducing withdrawal rates than imposing penalties for late completion.

Initially exerting some control over student pacing, and gradually reducing that control as the semester progresses, might be another way to effectively reduce student withdrawal rates. Under such a procedure, the number of bonus points a student would be offered for the early comple-

tion of a unit would be reduced as the semester progressed. Ritgood and Segrave (1975) employed a procedure similar to this and found that it resulted in students completing many units early in the semester.

Procedures such as those described above clearly have potential implications for student achievement, as well as for withdrawal rate. Research which investigates the effects of such procedures should contribute significantly to the identification of the most effective practices for use in PSI courses.

Reference Notes

1. Benecke, W. M., & Taylor, D. C. Effects of unit deadlines on performance in a PSI course. Paper presented at the meeting of the American Psychological Association, Chicago, September, 1975.

References

Alba, E., & Pennypacker, H. S. A multiple change score comparison of traditional and behavioral college teaching proceudres. Journal of Applied Behavior Analysis, 1972, 5, 121-124.

Bitgood, S. C., & Segrave, K. A. A comparison of graduated and fixed point systems of contingency-managed instruction. In Behavior Research and Technology in Higher Education, edited by J. M. Johnston. Springfield, Ill.: Charles C. Thomas, 1975.

Born, D. G., & Davis, M. L. Amount and distribution of study in a personalized instruction course and in a lecture course. Journal of Applied Behavior Analysis, 1972, 5, 33-44.

Born, D. G., & Whalen, P. Some descriptive characteristics of student performance in PSI and lecture courses. Psychological Record, 1973, 23, 145-152.

Cooper, J. L., & Greiner, J. M. Contingency management in an introductory psychology course produces better retention. Psychological Record, 1971, 21, 391-400.

Johnson, K. R., & Ruskin, R. S. Behavioral Instruction: An Evaluative Review. Washington, D.C.: American Psychological Association, 1977.

Keller, F. S. Goodbye teacher. Journal of Applied Behavior Analysis, 1968, 1, 79-89.

McGaw, D. L., & Watson, G. Political and Social Inquiry. New York: Wiley, 1976.

Malott, R. W., & Svinicki, J. G. Contingency management in an introductory psychology course for one thousand students. Psychological Record, 1969, 19, 545-556.

McMichael, J. S., & Corey, J. R. Contingency management in an introductory psychology course produces better learning. Journal of Applied Behavior Analysis, 1969, 2, 79-83.

Miller, L. K., Weaver, F. H., & Semb, G. A procedure for maintaining student progress in a personalized university course. Journal of Applied Behavior Analysis, 1974, 7, 87-91.

Moore, J. W., Mahan, J. M. & Ritts, C. A. Continuous progress concept of instruction with university students. Psychological Reports, 1969, 25, 887-892.

Morris, C. J., & Kimbrell, G. M. Performance and attitudinal effects of the Keller method in an introductory psychology course. Psychological Record, 1972, 22, 523-530.

Nelson, T. F., & Scott, D. W. Personalized instruction in educational psychology. Michigan Academician, 1972, 4, 293-302.

Powers, R. B, & Edwards, K. A. Performance in a self-paced course. Journal of Experimental Education, 1974, 42 (4), 60-64.

Robin, A. L. Behavioral instruction in the college classroom. Review of Educational Research, 1976, 55, 313-354.

Robin, A., & Graham, M. O. Academic responses and attitudes engendered by teacher versus student pacing in a personalized instruction course. In Personlized Instruction in Higher Education: Proceedings of the First National Conference, edited by R. S. Ruskin

& S. F. Bono. Washington, D.C.: Center of Personalized Instruction, 1974.

Semb, G., Conyers, D., Spencer, R., & Sanchez-Sosa, J. J. An experimental comparison of four pacing contingencies in a personalized instruction course. In Behavior Research and Technology in Higher Education, edited by J. M. Johnston. Springfield, Ill.: Charles C. Thomas, 1975.

Sheppard, W. C., & MacDermot, H. G. Design and evaluation of a programmed course in introductory psychology. Journal of Applied Behavior Analysis, 1970, 3, 5-11.

Witter, D. R., &Kent G. W. Teaching without lecturing: Evidence in the case for individualized instruction. Psychological Record, 1972, 22, 169-175.

Table 1

Completion and Withdrawal Data
by Treatment*

Treatment	No. of Students Completing	No. of Students Withdrawing	Total
Self-paced	11	21	32
Instructor-paced	20	10	30
Total	31	31	62

*$\chi^2 = 5.23$, $p < .05$

Table 2

Number of Quizzes Passed by Students Who Completed the Course

Number of Quizzes Passed	Number of Self-paced Students	Number of Instructor-paced Students	Total
13	2	2	4
14	0	1	1
15	9	17	26
Total	11	20	31

Table 3

Pacing Rate
by Treatment*

Treatment	Steady pace[a]	Not Steady Pace[b]	Total
Self-paced	4	13	17
Instructor-paced	17	5	22
Total	21	18	39

Note. Students who passed less than two quizzes are not included.

[a]Students who never went two consecutive weeks without passing a quiz.

[b]Students who went at least two consecutive weeks without passing a quiz.

* χ^2 (1) = 9.08, $p < .01$

Table 4

Number of Quizzes Passed and Number of Quizzes Failed by Students Who Completed and Students Who Withdrew*

Status	No. of Quizzes Passed	No. of Quizzes Failed	Total
Completed	456	86	542
Withdrew	75	39	114
Total	531	125	656

* X^2 (1) = 19.38, $p < .001$

Table 5

Completion and Withdrawal Data
by Pacing Rate*

Pacing Rate	No. of Students Completing	No. of Students Withdrawing	Total
Steady Pace[a]	20	1	21
Not Steady Pace[b]	11	7	18
Total	31	8	39

Note. Students who passed less than two quizzes are not included.

[a]Students who never went two consecutive weeks without passing a quiz.

[b]Students who went at least two consecutive weeks without passing a quiz.

*p = .023 (Fisher exact probability test)

No Later Than	Pacing Schedules (Number of Unit That Should be Passed to Receive the Grade Shown) A	B	C	D	Number of Unit Quizzes Passed for Each Week	Number of Last Unit Quiz Passed	Y = Penalized* (3 x's in a Column, and You are not Eligible for that Grade) A	B	C	D
1/24	1	1	1	1			No penalities will be given during the first week.			
1/31	2	2	2	2						
2/7	3	3	3	2						
2/14	4	4	3	3						
2/21	5	5	4	4						
2/28	6	6	5	5						
3/7	7	7	6	6						
3/14	8	7	7	6						
3/28	9	8	8	7						
4/4	10	9	9	8						
4/11	12	10	9	9						
4/18	13	12	10	10						
4/25	14	13	12	10						
5/2	15	14	13	12						
5/9	16	15	14	13						

*You will only be penalized if:

1 - You did not pass a unit quiz that week, and

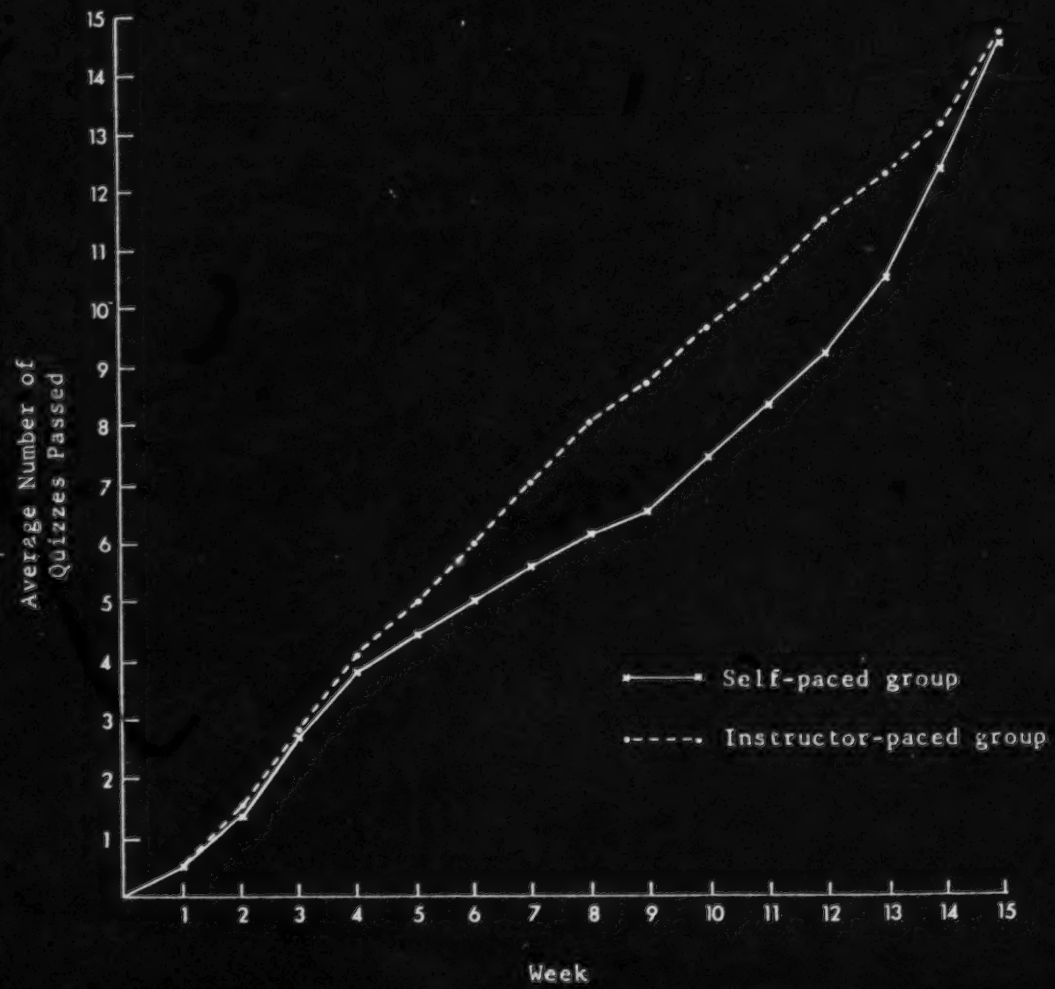
2 - You did not pass two unit quizzes the previous week, and

3 - You are behind the pacing schedule for that grade level

Note: You will not be required to pass unit eleven.

Figure 1

Pacing Information



Note: Students who completed two or more unit quizzes are included in these data up through the last week in which they took a quiz.

Figure 2

Cumulative Average Number of Quizzes Passed by Week